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A Study of Autologous Serum Skin Test and Autologous Serum Therapy in Chronic Urticaria

Research Article

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Abstract

Background: Chronic urticaria is defined as the recurrence of short-lived wheals three or more times per week for more than six weeks, with or without angioedema. Chronic urticaria is a frustrating condition that affects at least 0.1 percent of the population. Patients with chronic urticaria suffer from irritated itch and wheals, as well as a high antihistamine tablet load. The majority of chronic urticaria sufferers have an unknown or idiopathic cause. A subset of patients of chronic urticaria may have an autoimmune basis for their condition. The objective of the study was to compare the effectiveness of AST in patients with ASST positive and negative ASST and to see how AST affects the dermatological life quality index (DLQI) before and after treatment.

Methods: An interventional study was conducted in the Department of Dermatology OPD of our institute from October 2020 to October 2021. Thirty-Five patients were included in our study. The ASST of 35 patients included routine and specialized laboratory testing (thyroid function test, stool for ova). Patients were instructed to stop using antihistamines two days before the test. All patients had ASST conducted after receiving written authorization, and AST was administered to them regardless of their ASST status (2ml autologous serum i.m. in gluteal region once weekly for 9 consecutive weeks). Patients in both groups were told to take one tablet of levocetrizine (10 mg) if they felt wheals or itching, but not more than one pill per day. After 9 AST injections, a 4-week follow-up was taken. The key efficacy criteria were the urticaria activity score (UAS), total severity score (TSS), and DLQI, which were measured at baseline and weekly after each injection of autologous serum treatment.

Results: In patients of both groups, UAS and TSS showed significant improvement (>50%) after 5th week of therapy. In ASST positive patients, the improvement in DLQI score was slightly higher. A larger percentage of ASST positive patients enjoy symptom-free periods after a one-month follow-up period.

Conclusions: Both ASST positive and ASST negative individuals showed improvement in their symptoms. Patients with ASST positivity, on the other hand, showed a greater increase in quality of life as measured by the length of time they were symptom-free.

Keywords: Autologous serum skin test; Autologous serum therapy; Autoimmune urticaria; Urticaria activity score; Total severity score; Dermatologic life quality index

Introduction

Chronic urticaria is defined as the development of cutaneous wheals that occur on a regular basis (usually daily) for >6 weeks with individual lesions lasting from 4 to 36 hours [1].

Urticaria comes from the Latin term "urtica," which refers to the stinging nettle plant, which is now discovered to contain histamine.

The majority of chronic urticaria sufferers have an unknown or idiopathic cause. Chronic idiopathic urticaria or, more recently, chronic spontaneous urticaria are terms used to describe this condition. Autoimmune chronic urticaria is characterized by the presence of circulating IgG auto antibodies directed against the high affinity IgE receptor FcR1 on cutaneous mast cells, basophils, or, less typically, IgE itself [2].

ASST is used to identify autoimmune chronic urticaria. Debbarman et al. found autologous serum therapy (AST) to be a

promising approach for urticaria treatment, independent of ASST status (ASST positive or ASST negative) [3].

Chronic urticaria is a frustrating condition that affects at least 0.1 percent of the population. Patients with chronic urticaria suffer from irritated itch and wheals, as well as a high antihistamine tablet load [3]. As a result, newer effective modalities that reduce pill burden are required.

Aims and Objectives

- To compare the effectiveness of AST in patients with ASST positive and negative ASST.
- To see how AST affects DLQI before and after treatment.

Methods

An interventional study was conducted in the Department of Dermatology OPD of our institute from October 2020 to October 2021. Thirty-Five patients were included in our study.

Inclusion Criteria

We have included all patients above 18 years of age with refractory chronic urticaria in our study.

Exclusion Criteria

- Chronic urticaria due to predominantly physical causes
- Pregnancy and lactation
- Severe systemic illness
- Anticoagulation therapy
- Corticosteroids or immunosuppressive therapy

Scoring system used

- Urticaria Activity Score (UAS)
- Total Severity Score (TSS)
- DLQI
- Other scoring systems which can be used include

➢ **Angioedema Activity Score(AAS)**- Recommended for urticaria as standard measurement for assessing disease activity in patients with recurrent angioedema (RAE)

➢ **Chronic Urticaria Quality of Life(CU-Q2oL)** – Developed to refer to the disease's impact on and therapy in a patient's life, according to his/her perception

➢ **Angioedema Quality of Life(AE-QoL)** – It is a specific patient related outcome tool to assess quality of life impairment in recurrent angioedema patients

➢ **Urticaria Control Test (UCT)** - It is the first valid and reliable tool to assess disease control in patients with chronic urticaria. It is a retrospective approach and simple scoring system

➢ **Urticaria Severity Score(USS)** – It includes 12 questions and 7 responses per questions

➢ **UAS** - *i.e.* UAS calculated for 7 days once daily or twice daily [7]

Here, in our study we have used UAS scoring system for follow up due to following advantages

- Easy to calculate score
- Less time consuming
- Once weekly monitoring required
- Patients' opinion about their symptoms like intensity of pruritus can be taken into consideration
- Every week by calculating UAS we can know if patient is improving or not after starting therapy
- Psychologically it gives sense of relief to patients on improvement of their score

However, it has certain limitations like interindividual variations are present, variations in perception of symptoms like pruritus by patients, different number of wheals at different times of the day and also on different days, difficulty or error in calculating total number of wheals.

In an organised proforma, we have documented a complete history and examination. The ASST of 35 patients included routine and specialised laboratory testing (thyroid function test, stool for ova). Patients were instructed to stop using antihistamines two days before the test. All patients had ASST conducted after receiving written authorization. Autologous serum is prepared by collecting 5ml of patient's venous blood in a sterile vacutainer from which serum is separated by centrifugation at 2000X for 10 minutes. The serum separated by centrifugation is used immediately for ASST. Normal saline was used as a control. Approximately 0.05ml of autologous serum and normal saline is injected separately intradermally over volar aspect of forearm. Positive ASST is one with serum induced wheal which has a diameter of >= 1.5mm as compared to saline induced wheal at 30 minutes.AST was administered to patients regardless of their ASST status (2ml autologous serum i.m. in gluteal region once weekly for 9 consecutive weeks). Patients in both groups were told to take one tablet of levocetrizine (10 mg) if they felt wheals or itching, but not more than one pill per day. After 9 AST injections, a 4-week follow-up was taken. The key efficacy criteria were the urticaria activity score, total severity score, and dermatologic life quality index, which were measured at baseline and weekly after each injection of autologous serum treatment. When the average of two perpendicular diameters of the wheal was 1.5 mm greater than the saline wheal, ASST was termed positive.

Urticarial activity score which measure two symptoms, number of wheals (0-3 scale per day) and intensity of pruritus (0-3 scale per day) is given in Table 1 [4].

Urticaria Activity Score = Wheal score + Pruritus score

Total severity score is given in Table 2 [5].

Dermatology life quality index

A validated vernacular (Gujarati) version of the dermatological life quality index (http://www.dermatology.org.uk/downloads/DLQI

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Gujarati.pdf) was used to measure quality of life in urticaria patients. The DLQI consists of 10 items, each of which is rated between 0 and 3. Following the AST, each patient was scored to see how their quality of life (QoL) improved after treatment.

Results

A total of 35 instances were investigated. There were 19 females and 16 males in the group. The majority of the patients, 21 (60 percent), were between the ages of 20 and 40, with a range of 18 to 65 years. One patient (2.86 percent) had a family history. ASST was positive in 19 patients (54.29 percent) in group A and negative in 16 patients (45.7 percent) in group B as shown in Table 3. (7/19)36.84 percent of group A patients and (3/16)18.8 percent of group B patients had a history indicative of atopy. Thyroid function tests were positive in 7/19 individuals (36.84%) in group A and none in group B. After 9 weeks of therapy, we took a four-week follow-up and found that 73.68 percent of Group A patients and 62.5 percent of Group B patients were still entirely symptom-free from urticaria symptoms.

Discussion

Urticaria has been proved to have a major influence on patients' quality of life in the areas of mood, functionality, and symptoms since the time of Heberden, who first reported it. Chronic urticaria has an uncertain course, and therapy is continued until the condition is in remission. The need for innovative treatment modalities to support antihistamines and leukotriene inhibitors has long been recognised, and any adjuvant therapy that might minimise pill load while attaining symptom-free periods is urgently required. The improvement in quality of life (as judged by the DLQI) was shown to be considerable in individuals receiving AST in our study. The objective of treatment for chronic urticaria is to keep patients symptom-free for as long as possible while minimising side effects. The impact of methodology differences, the difficulty of precisely identifying a positive response, and the interpretation of data are only a few of the challenges in characterising ASST positivity. As a result, fresh strategies are still necessary for ASST standardisation. The percentage of ASST positive patients in our research (54.29%) was greater than that reported by Vikramkumar et al. (41.6%) [6]. Thyroid function tests were positive in seven individuals (36.84 percent of Group A patients and none of Group B patients), indicating a link between thyroid auto antibodies and auto reactive urticaria, as reported by George et al [7]. Group A patients had a higher baseline mean UAS (4.36 +/- 0.955) and TSS (13.47+/- 2.116) than Group B patients, who had a lower baseline mean UAS (3+/- 0.63) and TSS (11.375+/-1.204), which was statistically significant in comparison to George et al study, which found a trend toward a significant association between the severity of chronic urticaria and ASST positivity.[7] However, not all studies have found a significant difference in UAS or TSS between ASST-positive and ASST-negative individuals, indicating that these patients' UAS and TSS are varied. After 5 weeks of therapy, both groups of patients showed a more than 50% improvement in UAS. The improvement in UAS and TSS was greater in Group A participants after 9 weeks of treatment. In Group A patients, the improvement in DLQI score was also higher. A larger percentage of Group A patients enjoy symptom-free periods after a one-month follow-up period.

Autologous Serum Therapy demonstrated to be an adjuvant therapy in our research of ASST positive urticaria patients who were otherwise unresponsive to conventional therapy.

Table 1: Urticarial Activity Score.

SCORE	WHEAL	PRURITUS
0	None	None
1	Mild (<20 wheals/24hour)	Mild (present but not annoying or troublesome)
2	Moderate (20-50 wheals /24 hour)	Troublesome but does not interfere with sleep
3	Intense (>50 wheals/24 hour or large confluent areas of wheal)	Severe pruritus, which is sufficiently troublesome to interfere with normal daily activity or sleep

Table 2: Total Severity Score.

PARAMETER		SCORE		
	0	1	2	3
Number of wheals	None	<10	11-50	>50
Size of wheals	None	<1cm	1-3cm	>3cm
Intensity of pruritus	None	Mild	Moderate	Severe
Duration of persistence	None	<1hour	1-12 hours	>12 hours
Frequency of appearance	None	<once or Once a week	2-3 times/ week	Daily almost daily
Frequency of antihistaminic use	None	<once or Once a week	2-3 times/ week	Daily almost daily

Clear (TSS=0), Mild (TSS= 1-6), Moderate (TSS = 7-12), Severe (TSS= 13-18)

Table 3: ASST Positive and Negative Results.

SR.NO	ASST POSITIVE	ASST NEGATIVE	TOTAL
MALES	9	7	16
FEMALES	10	9	19
TOTAL	19	16	35

Table 4: Follow up after 9 weeks of ASST.

Follow up period	ASST positive(n=19)	ASST negative(n=16)
Completely asymptomatic	14(73.68%)	10(62.5%)

Conclusion

Patients with ASST positive had more severe urticaria symptoms. Both ASST positive and ASST negative individuals showed improvement in their symptoms. Patients with ASST positivity, on the other hand, showed a greater increase in quality of life as measured by the length of time they were symptom-free (Figures 1& 2).

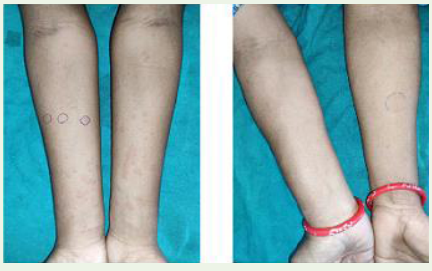

Figure 1: Positive ASST.

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Figure 2: Negative ASST.

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